

Geometry

3rd prep

2012-2013

1st - term

Trigonometry





Exercise on Unit (4) Lesson (1)

(1) ABC is a right angled Δ in C , AB = 13 cm , BC = 12 cm.

(a) Find the length of $\overline{AC}$

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(b) Find each of:-

Sin A = …………	,	**sin B = ……………**
Cos A = …………	,	**cas B = ……………**
Tan A = …………	,	**Tan B = ……………**

(c) Prove that:-

Sin A Cos B + cos A sin B = 1

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(d) Find : 1 + Tan² A

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(2) ABC is a Δ in which AB = AC = 10cm, BC = 12cm, Draw $\overrightarrow{AD} \perp \overline{BC}$, $\overrightarrow{AD} \cap \overline{BC} = \{D\}$,

<u>First</u>: *<u>Find the value of</u>* :

Sin (CAD) = ……….

Cos (CAD) = ……….

Tan (CAD) = ……….

<u>Second</u>: *<u>Prove that:</u>*

Sin^2 C + Cos^2 C= 1

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Sin B + Cos C > 1

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Exercise (4-1) P.Book

(1) In the opposite figure: Complete

(a) Sin χ = ………………

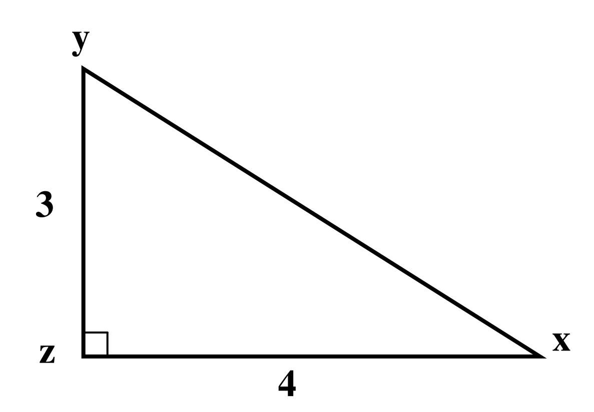
(b) Cos χ = ………………

(c) $Tan\ \chi$ = ………………

(d) $Cos\ Y$ = ………………

(e) $Tan\ Y$ = ………………

(f) $Sin\ Y$ = ………………



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(2) If the ratio between two complementary angles equals 3:5 find the value of each one by circular measure.

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(3) If the ratio between two supplementary angels as a ratio 3:5 find the value of each one by circular measure.

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(4) If the ratio between the measures of the interior angles of the triangle equals 3 : 4 : 7 , Find the circular measure for each angle.

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(5) ABC is a right angled triangle in B, where AB = 8cm, BC = 15cm.

Find each of the following trigonometric ratios:

Sin C = ………………..

Cos A = ……………….

Cos C = ……………….

Tan C = ……………….

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(6) ABC is a right angled triangle at B , If $2AB = \sqrt{3}\ AC$, **then find the main trigonometric ratios for angle C**

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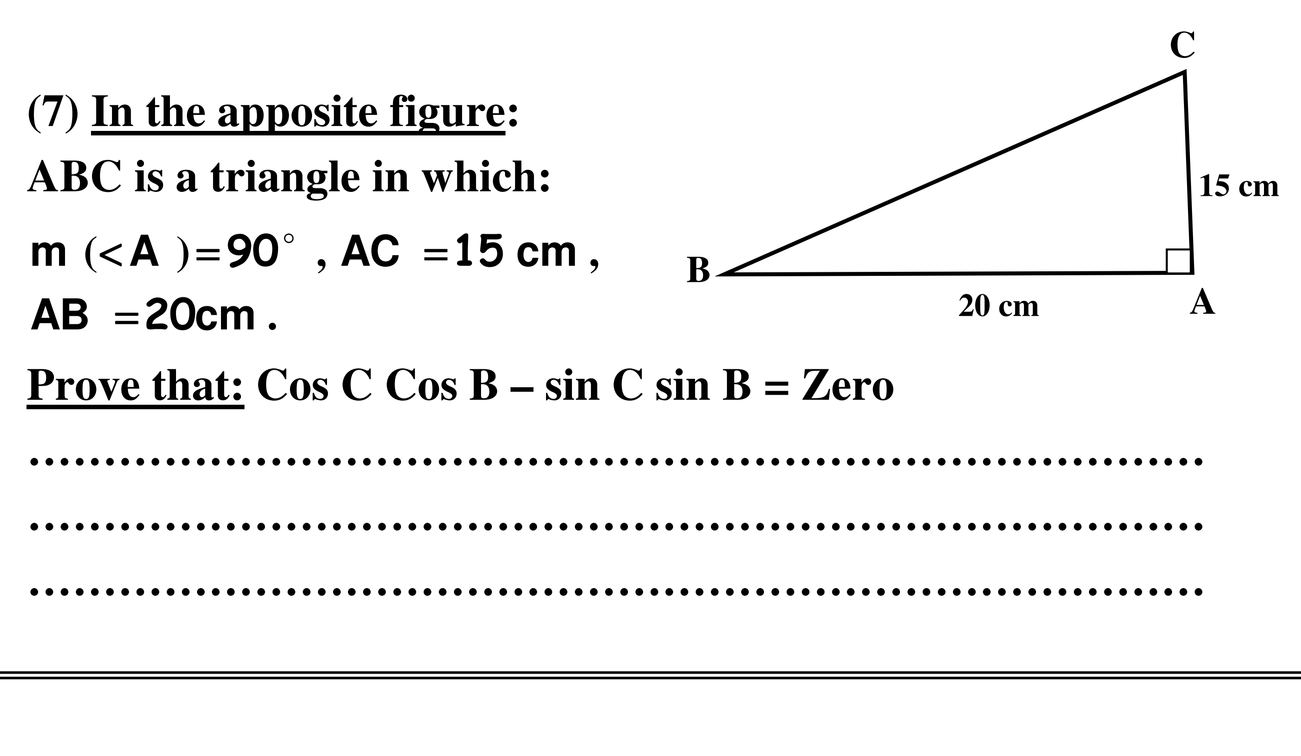
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(7) **In the apposite figure:**

ABC is a triangle in which:

$m(\angle A) = 90^\circ$, $AC = 15$ cm ,

$AB = 20$cm .



Prove that: **Cos C Cos B – sin C sin B = Zero**

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(8) XYZ is a right angled triangle at Y, Where XY = 5cm, XZ = 13cm

Find the value of:

(i) Tan x + Tan z = ……………..

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(ii) Cos x Cos z – sin x sin z = …………..

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(iii) Sin x Cos z + Cos x sin z = …………

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(9) XYZ is a right angled triangle at Z , where YZ = 7 cm , XY = 25 cm. Find the value of each of the following :

(i) (Tan X) (Tan Y)

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(ii) $\sin^2 X + \sin^2 Y$

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(10) ABCD is an isosceles trapezoid $\overline{AD} \parallel \overline{BC}$, AD = 4cm , AB = 5cm, where BC = 12cm.

Prove that :

$$\frac{5 \tan B \cos C}{\sin^2 C + \cos^2 B} = 3$$

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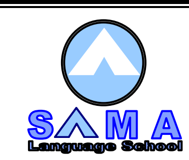
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Exercise based on lesson(2) Unit (4)

(1) ABC is an Isosceles Triangle, where AB = AC = 8cm, BC = 12cm , find:

* $m\ (\hat{B}) =$ ....

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* Area of triangle to the nearest two

decimal places

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……………………………… (Hint : draw $\overrightarrow{AD} \perp \overline{BC}$)

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(2) Complete:

(a) If sin $x = \frac{1}{2}$, where X is an acute angle, then m(<X)=……

(b) If cos $\left(\frac{x}{2}\right) = \frac{1}{2}$, where X is an acute angle, then

$m\ (< x) =$ ....

(c) $\text{Sin } 60^\circ + \cos 30^\circ - \text{Tan } 60^\circ =$ ....

(d) If $\text{Tan }(x + 10) = \sqrt{3}$,where x is an acute angle, then

$m\ (< x) =$ ....

(e)If $\text{Tan } 3X = \sqrt{3}$, where X is an acute angle, then

$m\ (< x) =$ ....

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(3) **Find the value of:**

$$\sin 45^\circ \cos 45^\circ + \sin 30^\circ \cos 60^\circ - \cos^2 30^\circ$$

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(4) **Prove that :**

(a) $\text{Cos } 60^\circ = 2\ \text{Cos}^2\ 30^\circ - 1$

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(b) $\text{Tan}^2\ 60^\circ - \text{Tan}^2\ 45^\circ = \text{Cos}^2\ 60^\circ + \text{Sin}^2\ 60^\circ + 2\ \text{Sin}\ 30^\circ$

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(5) <u>Find the value of x If</u>:

$4\chi = \cos^2 30^\circ \tan^2 30^\circ \tan^2 45^\circ$

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(6) Find F , where F is an acute angle ;–

$\sin F = \sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ$

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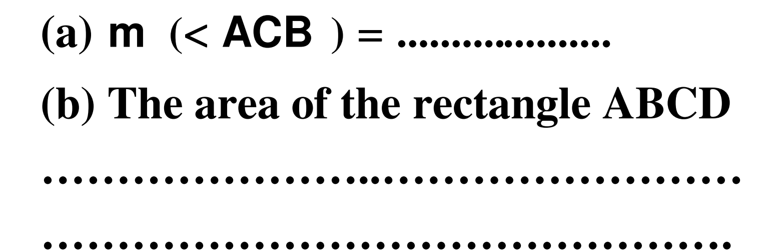
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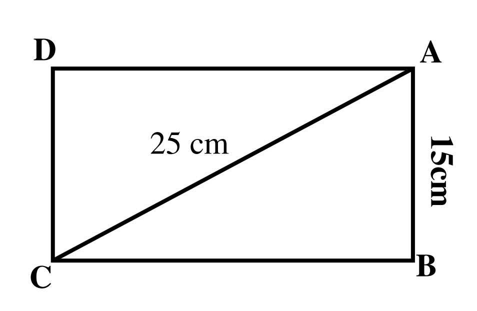
(7) <u>In the opposite figure</u>:

ABCD is a rectangle, in which AB = 15 cm, AC = 25 cm, find :



(a) m (< ACB) = ………………

(b) The area of the rectangle ABCD



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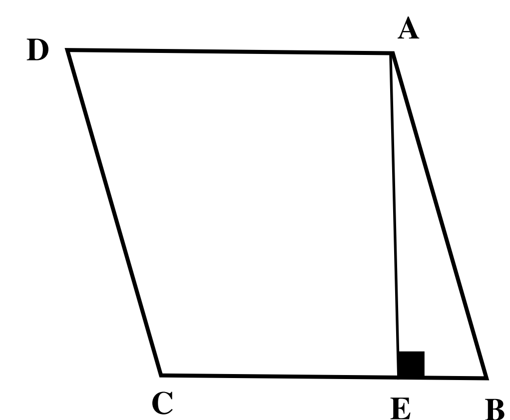
(8) In the opposite figure:

ABCD is a parallelogram of surface area 96 cm^2,

BE : EC = 1 : 3 , $\overline{AE} \perp \overline{BC}$, AE = 8cm

Find:

(a) the length of $\overline{AD}$



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(b) m (∠B)



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(c) The length of $\overline{AB}$ to the nearest one decimal number.

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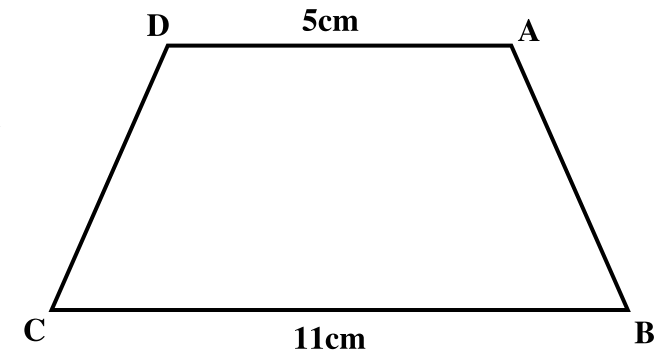
(9) In the opposite figure:

ABCD is an Isosceles Trapezoid, in which:

AB = AD = DC = 5cm, BC = 11 cm.

Find :

(a) m (∠ B) and m (∠ A)



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(b) The area of the isosceles trapezoid ABCD.

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Portfolio Question

(10) A trapezoid shaped piece of land ABCD in which $\overline{AD} \parallel \overline{BC}$, and m($\angle$B)= 90^o, AD =18 meters, BC = 33 meters , and DC = 25 meters , Find :

(i) The length of $\overline{AB}$.

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(ii) m($\angle$C)

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(iii) The land owner made a circular shaped fountain inside it ; What is the largest possible area for the fountain ?
Find the area of the remaining part of the land.

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General Exercise onUnit (4)

(1) **Prove that** :

(a) $\sin 60^\circ = 2\sin 30^\circ \cos 30^\circ$

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(b) $\text{Tan } 60^\circ = \dfrac{2\text{Tan } 30^\circ}{1-\text{Tan}^2 30^\circ}$

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(2)Without using calculator find the value of x (where x is an acute angle) satisfies each of the following:

(a) $\text{Tan } x = 4\cos 60^\circ \sin 30^\circ$

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(b) $2\sin x = \sin 30^\circ \cos 60^\circ + \cos 30^\circ \sin 60^\circ$

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(3) ABC is an Isosceles triangle, where

$AB = AC = 12.6 \text{ cm}$, $m(\angle C) = 84^\circ\ 24'$,

find to the nearest one decimal number the length of $\overline{BC}$.

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(4)

ABCD is a trapezoid , where $\overrightarrow{AD} \parallel \overline{BC}$, $m(\angle B) = 90^\circ$,

If AB = 3 cm , AD = 6cm , BC = 10cm , then prove that:

$$\text{Cos}(DCB) - \text{Tan}(ACB) = \frac{1}{2}$$

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(5) A ladder $\overline{AB}$ of length 6 meters , its upper edge A lies on a vertical wall and its other edge B on a horizontal floor . If C is the projection of point A on the surface of the floor and its angle of slope on the surface of the floor was 60° , then find the length of $\overline{AC}$.

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Coordinate Geometry

Unit (5)



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Unit (5) – Lesson (1)

Remember that:

AB = length of $\overline{AB}$

AB = distance between A and B

If A= (X_1 , Y_1) , B = (X_2 , Y_2)

Then AB = $\sqrt{(X_2 - X_1)^2 + (Y_2 - Y_1)^2}$

Complete the following table:

Shape	Conditions
* To prove Δ ABC is right at B (triangle with vertices A, B, C; right angle at B)	……………………………… ……………………………… ………………………………
* To prove Δ ABC is obtuse at B	……………………………… ……………………………… ………………………………
* To prove Δ ABC is Isosceles	……………………………… ……………………………… ………………………………
* To prove Δ ABC is equilateral	……………………………… ……………………………… ………………………………

* To prove ΔABC is acute (or) < A is acute	....
• To prove that : ABCD is a Square	....
• To Prove that : ABCD is a rectangle	....
• To prove that : ABCD is a parallelogram	....
• To prove that : ABCD is a trapezoid	....
• To prove that : ABCD is a Rhombus	....
* A , B , C are on the same straight line	....
A , B , C , D are on the same circle M .	....

Exercise (5-1) Pupil's book

(1) Complete the following:

(a)The distance between the point (-3 , 4) and the origin equals

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……………………………………………..

(b) The distance between the two points (-5 ,0) , (0 ,12) equals

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(c) The distance between the two points (15 , 0) and (6 , 0) equals ……………………………………………..

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(d) The length of the radius of the circle whose center (7 , 4) and passing through the point (3 , 1) equals

……………………………………………..

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(e) If the distance between the two points (a , 0) , (0 , 1) is the unit length , then a = ……………………………………………..

……………………………………………..

(2) Choose the correct answer:

1) The points (0 , 0), (6 , 0) , (0 , 8) are…………………

a- Form an obtuse angled triangle

……………………………………………………………..

b- Form an acute angled triangle

……………………………………………………………

c- Form right angled triangle

……………………………………………………………

d- are collinear

……………………………………………………………

2) A circle its center is the origin center and radius length 2 units. Which of the following points belong to the circle:

(a) (1 , 2) (b) (-2 , 1) (c) ($\sqrt{3}$, 1) (d) ($\sqrt{2}$, 1)

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3) Show which of the following sets of points are collinear:

(a) (1 , 4) , (3 , -2) , (-3 , 16)

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(b) (7 , 0) , (-3 , -3) , (22 , 9)

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(c) (-1 , - 4) , (1 , 0) , (0 , -2)

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(d) (-1 , -4) , (1 , 0) , (0 , -2)

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(3) Answer the following questions:

a) Find the value of a in each case of the following:

(i) If the distance between the two points (a , 7) , (-2 , 3) equals 5.

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(ii) If the distance between the two points (a , 7) , (3a -1 , - 5) equals 13

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(4) Determine the type of the triangle whose **vertices are A (-2 , 4) , B (3, -1) and C (4 , 5) according to its side lengths.**

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(5) Prove that **the triangle whose vertices A (5 , -5) , B (-1 , 7) and C (15 , 15) is right angled triangle at B , then find its total surface area.**

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(6) ABCD is a cyclic quadrilateral where A (5 , 3) , B (6 , -2) , C (1 , -1) and D (0 , 4) , prove that ABCD is a Rhombus , then find its total surface Area.

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(7) Prove that A (-2 , 5) , B (3 , 3) , C (-4 , 2) are not on the same straight line . If D (-9,4) prove that ABCD is a Parallelogram.

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(8) If A (x , 3) , B (3 , 2) , C (5 , 1) and AB = BC , find the value of x.

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(9) **If the distance between the point (x , 5) from the point (6 , 1) equals $2\sqrt{5}$, then find the value of x .**

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(10) Find the type of each triangle from the following triangles according to its angles:

(i) **A (3 , 10) , B (8 , 5) ,C (5 , 2).**

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(ii) **A (1 , -1) , B (2 , 1) , C (-3 , -2).**

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(iii) **A (3 , 3) , B (4 , -1) , C (1 , 1).**

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(11) Prove that the point A(-2 , 5) , B (3 , 3) , C (-4 , 2) are non collinear, and if D (-9 , 4) prove that the figure ABCD is a parallelogram.

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Ex. (5-2) P. Book

(1) Complete:

a) If the point of the origin is the midpoint of a straight segment $\overline{AB}$, where A (5 , -2)

then the coordinates of the point B are (….. , …...)

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b) If AB = BC = CD , A (1 , 3) , C (5 , 1) find:

1- The coordinates of the point B are (….. , …..)

………………………………………………………………………………

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2- The coordinates of the point D are (…... , …..)

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c) $\overline{AD}$ is the median in Δ ABC, M is the Midpoint of $\overline{AD}$ where A (0 , 8) , B (3 , 2) , C (-3 , 6) find:

1- The coordinates of the point D are (…. , ….).

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2- The coordinates of the point M are (….. , …..).

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Verify by determining the coordinates of the points.

(2)If C in the midpoint of $\overline{AB}$**, then find X ,Y , in each of the following cases:**

a) A(1 , 5)   B (3 , 7)   C (X, Y)

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b) A (-3 , Y)   B (9 , 11)   C (X , -3)

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c) A (X , -6)   B (9 , -11)   C (-3, Y)

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d) A (X , 3)   B (6 , Y)   C (4 , 6)

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(3) If **A (1 , -6) , B (9 , 2), then find the coordinates of the points which divide** $\overline{AB}$ **into four equal parts in length.**

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(4) Prove that the points **A (6 , 0) , B (2 , -4), C (-4 , 2) are the vertices of the right angled triangle at B , the find the coordinates of the point D that make the figure ABCD a rectangle.**

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(5) If the points **A (3 , 2) , B (4 , -3) , C(-1 , -2) D (-2 , 3) are vertices of the rhombus, find:**

a) The coordinates of the point where the two diagonals intersect.

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b) The area of the rhombus ABCD.

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(6) Prove that the points **A (-3 , 0) , B (3, 4) and C (1 , -6) are the vertices of an isosceles triangle of vertex A ,then find the length of the drawn straight segment from A perpendicular on** $\overline{BC}$

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(7) If **A (-1 , -1) , B (2 , 3) , C (6 , 0) and D (3 , -4) are four points in perpendicular coordinates plane. Prove that** $\overline{AC}$ **and** $\overline{BD}$ **bisect each other, then identify the type of the figure.**

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(8) Prove that the points **A (5 , 3), B (3 , -2) ,C (-2 , -4) are the vertices of the obtuse triangle at B ,then find the coordinates of the point D that makes the figure ABCD a rhombus , and find its surface area.**

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(9) ABCD is a parallegram where**, A (3 , 4) , B (2 , -1) , C (-4 , -3) : Find the coordinates of D. Take E ∈ $\overrightarrow{AD}$ where AE = 2 AD. What are the coordinates of the point E ?**

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Unit (5) – lesson (3)

Slope of st. line

1) Find the slope of the straight line that makes a positive angle in the positive direction of the x- axis, its measure:

A) 30^o

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B) 45^o

……………………………………………………………………

C) 60^o

……………………………………………………………………

2) Using the calculator, find the measure of the positive angle made by the straight line of slope (m) in the positive direction of X-axis in the following cases:

A) m = 0.3673

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B) m = 1.0246

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C) m = 3.1648

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3) Prove that the straight line passing through the two points (2 , 3) , (0 , 0) is parallel to the straight line passing through the two points (-1 , 4) , (1 , 7).

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4) Prove that the straight line passing through the two points (2 , -1) , (6 , 3) is parallel to the straight line that makes an angle of measure 45^{o} with the positive direction to the X-axis.

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5) If the straight line $\overleftrightarrow{AB}$ // the Y-axis where A (X , 7) , B (3 , 5) then find the value of X.

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6) If the straight line $\overleftrightarrow{CD}$ // the X-axis where C (4 , 2) d (-5 , y) then find the value of Y.

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7) Complete the following:

a) If $\overleftrightarrow{AB} // \overleftrightarrow{CD}$ and the slope of $\overleftrightarrow{AB} = \frac{2}{3}$ then the slope of $\overleftrightarrow{CD}$ equals

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b) If $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$ and the slope of $\overleftrightarrow{AB} = \frac{1}{2}$ then the slope of $\overleftrightarrow{CD}$ equals

…………………

c) The slope of straight line which is parallel to the straight line passing through the two points (2 , 3) , (-2 , 3) equals

…………………..

d) If the straight line $\overleftrightarrow{AB}$ is parallel to X-axis where A (8 , 3) , B (2 , K) then K = ………………..

e) If the straight line $\overleftrightarrow{CD}$ is parallel to the Y – axis where C (M , 4) , D (-5 , 7) then M equals……………

f) ABC is a right angled triangle in B , A (1 , 4) , B (-1 , -2) then the slope of $\overleftrightarrow{BC}$ equals……………….

g) If the straight line passing through the two points (A , 0) , (0 , 3) and the straight line that makes a triangle its measure is 30^{o} with the positive direction to the X-axis are perpendicular then :

A = ……………………

8) Prove that the straight line passing through the two points A (-3 , 4) C (-3 , -2) is perpendicular on the straight line passing through the two points B (1 , 2) , D (-3 , 2).

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9) If A (-1 , -1) , B (2 , 3) C (6 , 0) prove that the triangle ABC is right angled triangle in B.

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10) If the straight line L_1 passes two points (3 , 1) , (2 , K) and the straight line L_2 makes with the positive direction to the X-axis an angle of measure is 45^o then find K. If the two straight line L_1, L_2:

A) Parallel

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B) Perpendicular

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11) If the points (0 , 1) , (A , 3) , (2 , 5) are located on one straight line, then find the value of A.

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12) Prove that the points A (-1 , 1) , B (0 , 5) , C (5 , 6) D (4 , 2) are the vertices of the parallelogram.

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13) Prove by using the slope that the points A (-1 , 3) , B (5 , 1) , C (6 , 4) , D (0 , 6) are the vertices of the rectangle.

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14) In the figure drawn:

ABCD is trapezoid $\overline{AB}$ // $\overline{CD}$,

A (9 , -2) , B (3 , 2) , C (x , $-x$)

D (4 , -3) Find the coordinates of the point C

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15) Prove that the points A (4 , 3) , B (7 , 0) , C (1 , -2) are vertices of the triangle , and if the point D (1 , 2) then prove that : the figure ABCD is trapezoid and find the ratio between AD , BC

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General exercise on lesson (4)

The eq. of the st.line

(1) In the figure opposite, find the following:

a) The slope of the straight line (m).

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b) The length of the y-intercept (c).

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c) The equation of the straight line with given m and c.

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d) The length of the X intercept.

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e) The area of the identified triangle by X and Y axes.

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(2) **If $Y = mx + b$ represents the equation of straight line with its given slope and the y-intercept then complete the following:**

a) The equation of the straight line, when $m = 1$, $c = 3$ is the form of………………

b) The equation of the straight line, when $m = -2$, $c = 1$ is in the form of …………………

c) The equation of the straight line $m = 3$, $c = 0$, is in the form of …………………

(3) **Find the slope of the straight line and the length of the Y-intercept in each of the following:**

a) $2x - 3y - 6 = 0$

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b) $5x + 4y - 10 = 0$

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c) $\frac{X}{2} + \frac{Y}{3} = 1$

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(4) **Find the equation of the straight line in the following cases:**

a) When its slope is 2 and intersects a positive part from the Y-axis that is equal 7 unit.

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b) When slope is the straight line $\frac{Y-1}{X} = \frac{1}{3}$ and intersects a part from the negative direction 3 units.

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c) Passes by the two points (2 , -1) , (1 , 1) .

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d) The equation of the straight line where m = zero , c = zero.

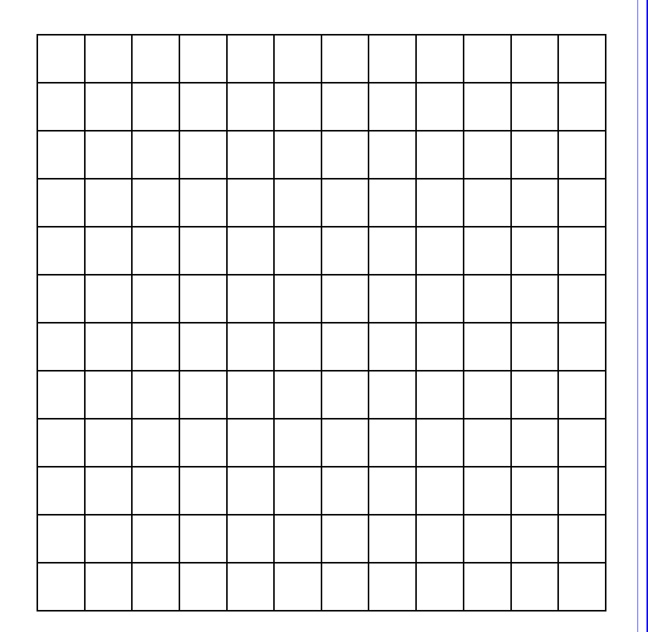
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(5) **Draw the straight line in each of the following:**

a) Its slope equals $\frac{-1}{2}$ and intersects a positive part of the Y-axis that is equal to one unit.

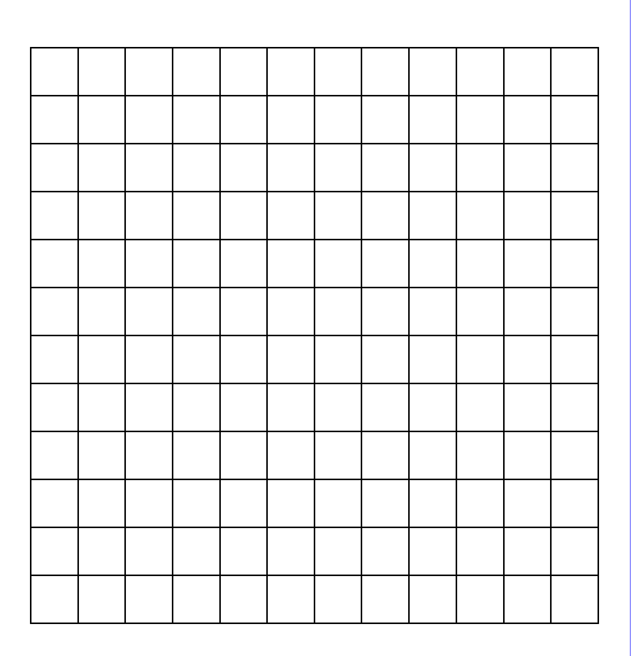


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b) Its slope equals 2 and intersects a negative part of the Y-axis equals 3 units.



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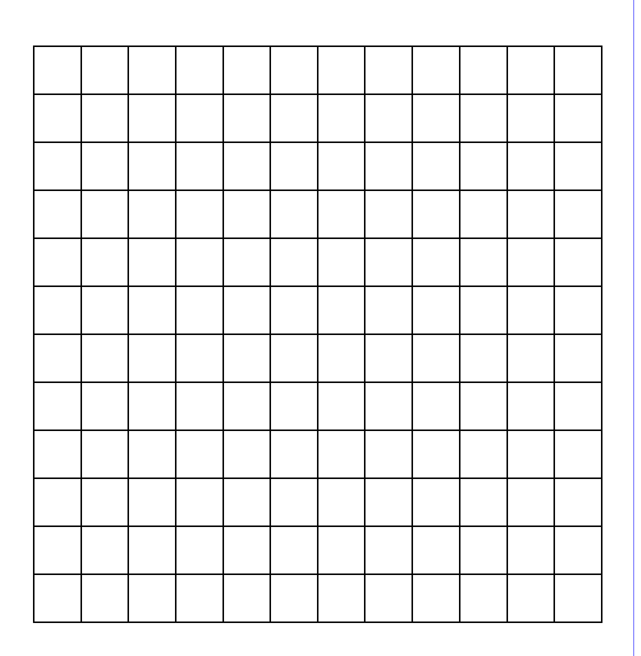
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c) Cuts from the two positive parts of the X-Y axis two parts, both length are 2 , 3 of the units respectively.

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(6) The following table represents linear relation:

x	1	2	3
Y=f(x)	1	3	A

a) Find the equation of the straight line.

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b) Find the length of the intersected part from the Y-axis.

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c) Find the value of A.

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(7) **In the figure opposite: The relation between distance the car covers is d in (kilometers), and time the car covers in is t in hour, find:**

a) The distance traveled in 90 minutes.

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b) The time which in the car traveled 150 kilometer.

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c) The velocity of the car.

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d) The equation of the straight line which converts the relation between d and t.

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(8) The figure opposite represents the distance traveled (D) in kilometers and the time (T) in minutes of the two objects A and B.

If A , B move at the same time.

a) After how many minutes did A and B intersect ?

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b) What is the velocity of A ?

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c) What is the velocity of A ?

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d) Write the equation of the straight line that represents the relation between the distance and the velocity to the movement of the object B ?

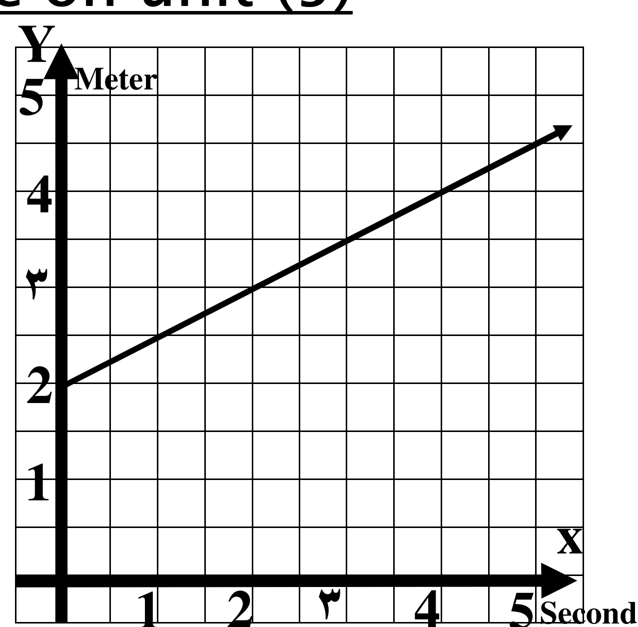
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General Exercise on unit (5)

[1] In the figure opposite :

A particle moves with a constant speed (v) where the distance (d) is measured by meter and time (t) by second.



Find the following :

(A) The distance at the beginning of moving.

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(B) The velocity of the particle.

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(C) The equation of the straight line which represented the movement of the particle.

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(D) The traveled distance after 4 seconds from the beginning of the movement.

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(E) The time in which the particle covers in distance of 3.5 meters from the beginning of the movement.

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[2] Choose the correct answer from the given answers :

(1) The straight line whose equation is $2x - 3y - 6 = 0$: its slope equals .... (-6 , -2 , $\frac{2}{3}$, 2)

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(2) If the two straight lines $3x - 4y - 3 = 0$ and $ky + 4x - 8 = 0$ are both perpendicular , then k equals ....

(-4 , -3 , 3 , 4)

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(3) If the two straight lines $x + y = 5$ and $kx + 2y = 0$ are both parallel , then k equals ....

(-2 , -1 , 1 , 2)

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(4) The area of the triangle in square unit , identified by straight lines $3x - 4y = 12$, $x = 0$, $y = 0$ equals ....

(6 , 7 , 12 , 11)

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(5) $\overleftrightarrow{AB}$ is a straight line , passes through the two points (2 , 5) , (5 , 2) which of the following points $\in \overleftrightarrow{AB}$

((1 , 6) , (2 , 3) , (0 ,0) , (3 , -4))

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(6) If A (3 , 5) , B (2 , -1) and C (x , y) then the coordinates of the point C that makes the triangle ABC a right angle triangle at B is ....

((6 , -1) , (-4 , 5) , (3 ,-2) , (8 , -2))

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[3] A (5 , -6) , B (3 , 7) and C (1 , -3) , then find the equation of the straight line passes through point A and the midpoint of $\overline{BC}$.

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[4] Find the equation of the straight line perpendicular to $\overline{AB}$ from its midpoint C where A (1 , 3) , B (3 , 5).

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[5] Find the equation of the straight line passing through the point (3 , -5) and parallel to the straight line

X + 2 y – 7 = 0 .

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[6] Find the equation of the straight line passing through the two points (4 , 2) and (-2 , -1) . Then prove that it passes through the origin point.

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[7] Find the equation of the straight line which intersects from the X – axis and Y – axis two positive parts both lengths are 4 and 9 units respectively.

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[8] ABC is a triangle where A (1 , 2) , B (5 , -2) and C (3 , 4) , D is the midpoint of $\overline{AB}$, draw $\overrightarrow{DE}$ // $\overleftrightarrow{BC}$ and intersects $\overline{AC}$ in E , find the equation of the straight line $\overleftrightarrow{DE}$.

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Nov. Revision sheet (Geom.)

(1)ABC is a right angles triangle at B in which AB = 8 cm and BC = 15 cm. write the value of each of the following trigonometric ratios: sin C tan A , cos A , cos C , tan C and sin A.

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(2) Δ ABC is right-angled at A in which AB = 9cm , and AC = 12cm find the value of: 2cos B tan B-sin C

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(3)ABC is triangle , draw $\overrightarrow{AB} \perp \overline{BC}$ to cut it at D , if AB = 13cm , AC = 20cm and CD = 16 cm. Find the value of each of: sin B , cos C , cos ($\angle$BAD) and tan ($\angle$DAC).

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(4)Without using the calculator prove that:

(i) $\cos 60^{\circ} = 2\cos^{2} 30^{\circ} - 1$

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(ii) $2\cos^{2} 45^{\circ} - 1 = 1 - 2\sin^{2} 45^{\circ}$

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(iii) $\text{Cos } 60^{\circ} = \cos^{2} 30^{\circ} - \sin^{2} 30^{\circ}$

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(5) Find the value of X if:

(i) tan X = 4 sin 30° cos 60° , where X is the measure of an acute angle.

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(ii) Sin 2X = $\frac{\sqrt{3}}{2}$ **, where 2X is the measure of an acute angle.**

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(6)Using calculator , find Q in each of the following:

where Q is the measure of an acute angle.

(i) Sin Q = 0.4652

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(ii) Cos Q = 0.6766

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(iii) Tan Q = 2.4577

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(7) ABCD is a rectangle whose diagonal length AC = 24cm,

m ($\angle$ACB) = 25°. Find the length of : $\overline{BC}$

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(8) ABCD is an isosceles trapezium in which: $\overline{AD} \parallel \overline{BC}$,

AD = 4cm, AB = 5cm, and BC = 12 cm.

Prove that: $\dfrac{5\tan B \cos C}{\sin^2 C + \cos^2 B} = 3$

If A (3 , 1) , B (1 , 2) and C (5 , 4) , prove that: BC = 2 AB

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(9) Prove that: Δ ABC is right – angled at B where A (2, 0) , B (3 , 2) and C (-5 , 6) , then find its area.

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(10) Prove that the points A (0 , 1) , B (4 , 5) , C (1 , 8) and D (-3 , 4) are vertices of a rectangle and find its diagonal length.

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(11) Prove that the point M (-4 , 6) is the center of the circle which passes through the point A (-6, 2) , B (0 , 8) , and C (-8 , 4) and find the length of its diameter.

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(12) Choose the correct answer:

1) If A (0 , 0) , B (2 , 3) are two points in the Cartesian coordinates plane, then AB = ...

($\sqrt{5}$, $\sqrt{7}$, $\sqrt{11}$, $\sqrt{13}$)

2) The distance between the point (2 , -3) and X-axis is .... length unit.

(2 , -3 , $\sqrt{13}$, 3)

3)The distance between the point (2 , -3) and Y-axis is ....length unit.

(2 , -3 , $\sqrt{13}$, $\sqrt{5}$)

4) In the Cartesian coordinates plan, the point that is at a distance 2 length unit from the origin may be ....

((1 , 2) , (2 , 1) , (0 , 2) , (-3 , 5))

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(13) Find the coordinates of the midpoint of $\overline{AB}$ in which A (8 , 2) , B (-2 , -6) .

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(14) If the point (X , 0) is the midpoint of the line segment whose ends are (1 , -5) and (2 , 5) , find the value of X .

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(15) If A (-3 , 4) is the midpoint of $\overline{BC}$ where B (6 , 3) , find the coordinates of C.

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(17) ABC is a triangle, its vertices are A (2 , -2) , B (8 , -4) and C (5 , 7) . ***Prove that*** Δ ABC is right-angled at A. ***Find*** the center of the circle passing through the vertices of the triangle.

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(18) Prove that the straight line which passes through the two points (4 , 2) an (5 , 6) is parallel to the straight line which passes through the two points (0 , 5) , (-1 , 1)

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(19) Prove that the straight line which passes through the two points A (-1 , 4) and C (-1 , -2) is perpendicular to the straight line which passes through the two points B (1 , 1) and D (-3 , 1)

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<u>(20) Complete:</u>

1) The slope of the straight line which is perpendicular to Y-axis equals………………

2) If A (-1 , 3) and B (2 , 5) , then the slope of the straight line perpendicular to $\overleftrightarrow{AB}$ = …………………

3) If the slope of the straight line passing through the two points (-1 , 4) and (2 , Y) = $\frac{1}{3}$, then Y = ……………

4) If 1 and $\frac{a}{2}$ are the two slopes of two perpendicular straight lines, then a = ...

5) If ABCD is a rectangle where: A(-2 , 2)and D(-1 , 5), then: First: the slope of $\overleftrightarrow{BC}$ equals ....

Second: the slope of $\overleftrightarrow{AB}$ equals ....

Third: the slope of $\overleftrightarrow{CD}$ equals....................

(21) Prove that: A (-1 , 4) , B (-2 , 2) and C (-3 , 0) are collinear with 2 different methods.

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(22) If A (1 , 7) , B (-1 , 5) , and C (4 , 2) , prove that :

$C \notin \overleftrightarrow{AB}$

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(23) Prove that the points A (-1 , -1) , B (2 , 3) , C (6 , 0) and D (3 , -4) are vertices of a square.

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(24) If the points A (5 , 7) , B (X , 3) , and C (1 , 8) are vertices of a right angled triangle at A , find the value of X.

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